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| 09/869,904 | 07/09/2001 | Yataro Ichikawa | | 1269 |

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| ART UNIT | PAPER NUMBER |
|---|---|
| 1754 | |

DATE MAILED: 11/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/869,904 | ICHIKAWA, YATARO | |
| | Examiner | Art Unit | |
| | Jonas N. Strickland | 1754 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *16 September 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-14 and 16-21* is/are pending in the application.

4a) Of the above claim(s) *17* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14,16,18 and 20* is/are rejected.

7)☒ Claim(s) *19 and 21* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7/01*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election without traverse of claims 1-14, 16 and 18-21 in the reply filed on 9/16/04 is acknowledged.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 2, 4, 7, 13, 14, 16, 18, and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Durand et al. (US Patent 5,965,481).

Applicant claims an apparatus for treating an exhaust gas in a passage of the exhaust gas by installing a liquid-including substance having at least one liquid selected from: the liquid containing a salt including oxygen acid radical of nitrogen in an amount exceeding a salt including carbonic acid radical dissolved in the liquid-including substance, and the liquid containing a salt including oxygen acid radical of nitrogen having solid that can form the salt including oxygen acid radical of nitrogen by absorbing nitrogen oxides.

Durand et al. discloses a process for preparing a catalyst suitable for the treatment of exhaust gases from internal combustion engines. Durand et al. continues

to disclose an aqueous solution comprised of 50 grams of barium carbonate and 400 grams of a cerium nitrate solution (col. 9, lines 55-62). Therefore, Durand et al. discloses a liquid containing a salt including oxygen acid radical of nitrogen in an amount exceeding a salt including carbonic acid radical dissolved in the liquid-including substance. Durand et al. continues to disclose wherein a catalyst is also present comprised of palladium and rhodium (col. 6, lines 10-17; col. 10, lines 11-15). The catalyst is operated at a temperature of 300°C, with respect to claims 14 and 16 (col. 12, lines 7-12). Durand et al. continues to disclose wherein the catalysts are useful for treating exhaust gases, which include nitrogen oxides. With respect to claim 20, Durand discloses wherein the catalyst is used for automotive combustion catalysts, therefore it is used with a vehicle (col. 1, lines 13-16).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 3, 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Durand et al. (US Patent 5,965,481) in view of Kurokawa et al.(US Patent 6,420,306 B2).

Applicant claims with respect to claims 3, 5, and 6 wherein the liquid-including substance is the liquid containing the salt including oxygen acid radical of nitrogen having solid that can form the salt including oxygen acid radical of nitrogen by absorbing nitrogen oxides.

The teachings of Durand et al. have been discussed with respect to claims 1, 2, 4, 7, 13, 14, 16, 18 and 20. However, Durand et al. is silent in regards to the limitations of claims 3, 5, and 6.

Kurokawa et al. teaches a purifying catalyst comprised of barium carbonate and a barium nitrate, along with a palladium nitrate solution. Kurokawa et al. teaches wherein the barium is in the form of a solid barium compound (col. 4, lines 23-65). The barium compound is essential in absorbing nitrogen oxides (col. 9, lines 36-47).

Therefore, it would have been obvious to one of ordinary skill in the art to modify the teachings of Durand et al., by utilizing a liquid substance comprised of a nitrate and a carbonate radical, which is useful for absorbing nitrogen oxides, based on the teachings of Kurokawa et al., because Kurokawa et al. teaches a purifying catalyst comprised of barium carbonate and a barium nitrate, along with a palladium nitrate solution. Kurokawa et al. teaches wherein the barium is in the form of a solid barium compound and wherein the barium compound is essential in absorbing nitrogen oxides. Such modification would have been obvious to one of ordinary skill in the art, because

one of ordinary skill in the art, would have expected a process for treating exhaust gases with a liquid solution comprised of a carbonate and nitrate as taught by Kurokawa et al., to be similarly useful and applicable to a process for treating exhaust gases with a liquid substance comprised of carbonate and nitrate radicals as taught by Durand et al.

7. Claims 8-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Durand et al. (US Patent 5,965,481) in view of Golden (US Patent 5,939,354).

Applicant claims with respect to claims 8-12, wherein the salt including oxygen acid radical of nitrogen is hydrated salt and wherein the oxygen acid radical of nitrogen includes at least one of metallic ions selected from sodium, potassium, magnesium, and calcium.

The teachings of Durand et al. have been discussed with respect to claims 1, 2, 4, 7, 13, 14, 16, 18 and 20, but the reference is silent in regards to the limitations of claims 8-12.

Golden teaches a perovskite-type metal oxide compounds and method for preparing the compounds, which are useful in reducing nitrogen oxides. The compounds are comprised of an aqueous solution of calcium nitrate tetrahydrate, as well as mixed hydroxide hydrated lanthanide carbonate (col. 7, lines 54-61).

Therefore, it would have been obvious to one of ordinary skill in the art to modify the teachings of Durand et al., based on the teachings of Golden, wherein the salt including oxygen acid radical of nitrogen is hydrated salt and wherein the oxygen acid radical of nitrogen includes at least one of metallic ions selected from sodium, potassium, magnesium, and calcium, because Golden teaches a perovskite-type metal

oxide compounds and method for preparing the compounds, which are useful in reducing nitrogen oxides, wherein the compounds are comprised of an aqueous solution of calcium nitrate tetrahydrate, as well as mixed hydroxide hydrated lanthanide carbonate. Golden clearly teaches using a metallic ion, such as calcium, which meets claims 9-12. Such modification would have been obvious to one of ordinary skill in the art, because one of ordinary skill in the art, would have expected a process for treating nitrogen oxides with a liquid substance comprised of nitrate and carbonate radicals as taught by Golden to be similarly useful and applicable to a process for treating exhaust gases comprised of nitrogen oxides wherein a liquid-substance comprised of nitrate and carbonate radicals are utilized as taught by Durand et al.

***Allowable Subject Matter***

8. Claims 19 and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter: The cited prior art fails to disclose an apparatus comprised of a reaction zone device equipped with at least one pool where at least one exhaust gas blow nozzle is opened at least in the liquid-including substance and in the vicinity of the surface of the liquid-including substance in the pool, and with at least one capturing zone that captures entrainment of the liquid-including substance and an after-treatment zone and a means for feeding water to the after-treating device and then to the reaction zone.

***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent 5451558; US Patent 5599758; US Patent 5874057; US Patent 6387138; US Patent 6548446.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonas N. Strickland whose telephone number is 571-272-1359. The examiner can normally be reached on M-TH, 7:30-5:00, off 1st Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jonas N. Strickland
November 17, 2004

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SUPERVISORY PATENT EXAMINER
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